MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION

2018/2019 ACADEMIC YEAR

FIRST YEAR **FIRST** SEMESTER EXAMINATION FOR, DIPLOMA IN INFORMATION TECHNOLOGY

SIT 051 – DATABASE SYSTEMS

DURATION: 2 HOURS

DATE: 14/12/2018

TIME: 9 – 11 A.M.

Instructions to candidates:

1. Answer question One and Any Other Two questions.

2. Mobile phones are not allowed in the examination room.

3. You are not allowed to write on this examination question paper.

SECTION A: ANWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) Define the following terms as used in database systems   (4 marks)
- i. Normalization
- ii. Database integrity
- iii. Query
- iv. Logical design

b) The earliest business computer systems used to store groups of records in a single file. Explain three challenges of this type of approach   (6 marks)

c) Describe the classification of databases based on each of the following criteria
       (4 marks)
- i. Number of users
- ii. Location

d) Distinguish between internal and external schema as used in database design (4 marks)

e) A teacher noted that a database created by Andrew had data redundancy. Highlight three problems that this may cause   (3 marks)

f) Outline any three functions of a database management system   (3 marks)

g) A car company dealing with importation of cars on behalf of clients is based in Mombasa. Shipped vehicles are characterized by; unique car identification number, car weight, car type, destination and delivery date. Shipped vehicles are received at the company go-downs. Each go-down is characterized by; unique go-down id, location and telephone number. Shipped vehicles make their way to their clients via road. Each client is characterized by; a unique client id, client's name, address and the type of transport used to deliver the cargo. Draw an entity relationship diagram for the above information
       (6 marks)

SECTION B - ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) State two differences between a primary key and a foreign key as used in database
       (4 marks)

b) Describe three levels of database architecture   (6 marks)

c) A learning institution maintains details of its lecturers who are teaching various units as follows:
Lecturer No, lecturer name, grade, department code, department name, subject code, subject name, subject level
Each lecturer may teach many subjects but may not belong to more than one department. Normalize this data to 3rd normal form   (9 marks)

d) Highlight any two components of a database environment   (1 mark)

QUESTION THREE (20 MARKS)

a) Highlight three importance of normalization in database design (3 marks)
b) Discuss any three data types supported by MS Access (6 marks)
c) Table 1 is an extract from a database. Use it to answer the questions that follow

Student ID	Course ID	Student name	Marks
100200	C236	Catherine	70
100201	C236	Agnes	80
100302	C242	Stephen	90
100322	C240	Alexis	80
100328	C240	John	86
100352	C240	Jeremiah	79
100201	C241	Agnes	90

Table 1: student table

Write SQL statements to perform each of the following:

  i. Display student ID, student name for all students whose course ID is C240

  (2 marks)
  ii. Display the lowest mark scored for course ID C236 (2 marks)
  iii. Sort the table by the student name in descending order (2 marks)
  iv. Display all the records having names with letters "h" (2 marks)
d) List any three types of queries (3 marks)

QUESTION FOUR (20 MARKS)

a) Define the term database security as used in database (2 marks)
b) Explain the function of the following in a database management system (4 marks)
   i. Data manipulation language
   ii. Data definition language
c) Explain three circumstances under which a hospital would use a database management system (6 marks)
d) With the aid of a diagram, explain the database lifecycle (8 marks)